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ABSTRACT

The purpose of this study was to examine the effects of strategically teaching metacognitive skills to high-, medium-, and low-achieving fourth grade students, and how it influenced their ability to comprehend grade level texts. Nine children participated in the experimental group, and nine were selected for the control group. A pre/post miscue test and comprehension evaluation were utilized to show individual growth, and gain scores were used to compare between the experimental and control groups. Results indicated strategic teaching of metacognitive skills did influence a child's ability to comprehend grade level texts. An analysis of the data collected revealed all students in the experimental group used one or more of the metacognitive skills to aid in their comprehension. After comparing the miscue and comprehension scores of the experimental and control groups, it may be suggested that teaching metacognitive skills is an effective means of instruction for influencing the reading comprehension of fourth grade students. Contains 46 references, and 2 tables and 4 figures of data; appendixes contain a comprehension evaluation form, reading miscue texts, criteria for selecting students, a student nonfiction retelling assessment form, and a list of journal starters for student response journals. (Author/RS)

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ED 431 177

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A Study of the Effects of Metacognition on Reading Comprehension

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In Partial Fulfillment of the Requirement
for the
Degree of Master in Education

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by
Micki Cattell
Master's Project
Summer 1999

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A Study of the Effects of Metacognition

on Reading Comprehension

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A Project Presented to the College of Education Faculty
of
San Diego State University

By
Micki Cattell

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Approved by

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Dr. Nancy Farnan

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Date

Table of Contents

Signature Page ii

Table of Contents iii

List of Tables v

List of Figures vi

Abstract vii

Chapter I: Introduction 1

Chapter II: Literature Review 4

Chapter III: Methodology 10

- Sample 11
- Research Procedures 12
- Experimental Group 13
- Control Group 14
- Sample 14
- Metacognitive Strategies 15
- Mini-lessons 15
- Assessments 17

Chapter IV: Findings 18

- Miscue and Comprehension Evaluation Results 19
- Teacher Log 25
- Student Response Journals 27

Chapter V: Discussion 30

- Conclusions 30
- Implications 31
- Limitations of the Study 32
- Directions for Further Research 33

References 34

Appendix A: Comprehension Evaluation 39

Appendix B: Reading Miscue #1 40
Appendix C: Criteria for Selecting Students 41
Appendix D: Reading Miscue #2 42
Appendix E: Student Non-fiction Retelling Assessment 43
Appendix F: Journal Starters for Student Response Journals 44

List of Tables

Table 1: Teacher Conference Log: Student Use of Metacognitive Strategies 26

Table 2: Student Response Journals: Use and/or Acknowledgement of Metacognitive Strategies 28

List of Figures

Figure 1: Experimental class: fall and spring comprehension evaluation 20

Figure 2: Experimental class: fall and spring miscue scores 21

Figure 3: Control class: fall and spring comprehension evaluation 23

Figure 4: Control class: fall and spring miscue scores 24

ABSTRACT OF THE PROJECT

A Study of the Effects of Metacognition on Reading Comprehension of Fourth Grade Students

The purpose of this study was to examine the effects of strategically teaching metacognitive skills to high-, medium-, and low-achieving fourth grade students, and how it influenced their ability to comprehend grade level texts. Nine children participated in the experimental group, and nine were selected for the control group. A pre/post miscue test and comprehension evaluation were utilized to show individual growth, and gain scores were used to compare between the experimental and control groups. Results indicated strategic teaching of metacognitive skills did influence a child's ability to comprehend grade level texts. An analysis of the data collected revealed all students in the experimental group used one or more of the metacognitive skills to aid in their comprehension. After comparing the miscue and comprehension scores of the experimental and control groups, it may be suggested that teaching metacognitive skills is an effective means of instruction for influencing the reading comprehension of fourth grade students.

Chapter 1

Introduction

According to some, we are in a literacy crisis. We are not helping students acquire the strategic reading skills they will need to cope with the ever-increasing demands of the marketplace (Barton, 1997). In 1994, one quarter of our nation's high school seniors and nearly a third of our eighth graders failed to reach even the basic level on the National Assessment of Educational Progress (NAEP) reading assessment. Most of our students lack critical reading skills; few read regularly (Barton, 1997). Educators and the public are in a frenzy over how to boost reading comprehension scores (Keene & Zimmermann, 1997, p. ix).

The history of reading comprehension instruction in the United States is actually very brief. The term "comprehension" seems first to have been used by J. Russell Web in the third reader of his series, National Readers, in 1856 (Flood & Lapp, 1990). Prior to that time there had been little to no research on the topic. There does seem to be evidence that comprehension was not included as a major thrust in reading instruction in the early years because it was thought to be a logical by-product of learning to read (Flood & Lapp, 1990). Perhaps the most significant shift in emphasis in reading comprehension instruction that is observable from published research reports occurred in the early part of the twentieth century (Flood & Lapp, 1990). Educators shifted their emphasis from oral reading as a means for "getting meaning" to an emphasis on improving comprehension during silent reading (Mathews, 1966).

The early twentieth-century movement seems to have resulted in a contemporary concern to move the focus of learning from external control of comprehension (prescribed

materials and predetermined activities) to internal control in which students generate their own perspectives, interpretations, and understandings (Flood & Lapp, 1990).

These shifts in practice over the years seem to reflect a growing understanding of the mental processes that are involved in comprehension and an understanding that these processes can be acquired and developed through instruction and practice (Flood & Lapp, 1990). Because of this new perspective on the processes of literacy, much of the research on comprehension has focused on the importance of developing strategic, independent readers (Cross & Paris, 1988; Dole, Duffy, Roehler, & Pearson, 1991; Cross, Lipson, & Paris, 1984; Paris, Wasik, & Turner, 1991; Pearson & Fielding, 1991; Pressley, Johnson, Symons, McGoldrick, & Kurita, 1989; Winograd & Paris, 1989). Metacognition plays an important role in effective comprehension and retention of text (Baker & Brown, 1984). The concept of metacognition is one of the most important contributions cognitive psychologists have made to the field of reading education. The term metacognition means different things to different people, but most agree that it involves two basic components: knowledge about cognition and regulation of cognition (Baker, 1991, p. 2). Metacognitive knowledge encompasses our characteristics as learners, the aspects of a cognitive task, and the use of strategies for completing such a task (Flavell, 1981). The primary purpose of providing students with instruction in metacognition is to enable them to take responsibility for their own learning and comprehension activities (Baker, 1991, p.3). Psychologists believe that the best way to achieve this goal is by gradually transferring responsibility for regulation from one more knowledgeable person to the youngsters (Vygotsky, 1978). Awareness of metacognitive skills can be gleaned through instruction. Teachers can help their students learn from reading:

they can encourage students to take an active role in reading. The goal is to develop active, independent learners. Integrating metacognitive skills into classroom instruction can make that goal attainable (Collins, 1994).

The purpose of this study was to examine the effects of strategically teaching metacognitive skills to high-, medium-, and low-achieving fourth grade students, and how it influences their ability to comprehend grade level texts.

Chapter 2

Literature Review

To make an individual metacognitively aware is to ensure that the individual has learned how to learn. The individual behaves in reflective, planful, and, where necessary, self-corrective ways. An important feature of executive routines is that they can be taught (Garner, 1987). The concept of an "Executive controller" or a "Homunculus" in our psyche is not new. For example, William James (1890) wrote of a "fringe" of consciousness, in which we experience things such as a "feeling of rightness" and a "feeling of knowing," referring to the metacognitive feeling of an answer being correct or not, or self-monitoring comprehension of information.

Vygotsky (1978) presented similar ideas. He described the learning process as a social process whereby a procedure or behavior is guided and monitored by other individuals. Gradually, an individual becomes more experienced or competent and moves toward self-regulation, with another person supervising. At the end, the person is able to self-regulate, or to monitor his/her own behavior. In essence, Vygotsky describes internalizing a supervisor, or executive controller, to monitor one's performance or behavior (Osborne, 1994).

Metacognition has to do with the active monitoring and regulation of cognitive processes. It represents the "executive control" system that many cognitive theorists have included in their theories. Examples of such theorists are Miller (1956) and Schoenfeld (1987). Metacognitive processes are central to planning, problem-solving, evaluation and many aspects of language learning.

Metacognition's role in reading is one of the most important contributions cognitive psychologists have made to the field of reading education. Metacognition refers to the awareness and control individuals have over their cognitive processes (Baker, 1991, p.2). Based on Flavell's (1976) work, Jacobs and Paris (1987) were able to define metacognition as any knowledge about cognitive states or processes that can be shared among individuals (i.e., cognitive knowledge is knowledge which can be demonstrated, communicated, examined, and discussed between persons). This definition is appealing because it presumes that metacognition is knowledge about one's cognitive processes which can be shared and is therefore reportable (Miller, 1990, p.21).

Throughout the 1980s, many researchers focused on the relationship of metacognitive skills to reading comprehension (Jacobs & Paris, 1987; Kobasigawa, Ranson & Holland, 1980; Markman & Gorin, 1981; Paris & Jacobs, 1994; Paris & Meyers, 1981; Wong & Jones, 1982). A result of this research was the focus toward developing strategic, independent readers, those who know when, why, and how to use strategies to facilitate comprehension (Cross & Paris, 1988; Dole et al., 1991; Paris & Jacobs, 1994; Paris et al., 1991; Pearson & Fielding, 1991; Pressley et al., 1989; Winograd & Paris, 1989). Despite the success of such research, Schmitt and Baumann (1990) found that metacognition was not being fostered in elementary classrooms because, seemingly, teachers were taking responsibility for comprehension monitoring themselves rather than promoting these skills on the part of their students (Hopkins, 1982).

Older and better readers appear to engage spontaneously in comprehension monitoring, whereas younger and poorer readers seem to show little comprehension

monitoring, hence little use of metacognitive strategies (Baker & Brown, 1984; Forrest & Waller, 1981; Owings, Petersen, Bransford, Morris, & Stein, 1980). There are differences in knowledge and regulation of cognition between older and younger children and between skilled and less skilled readers of the same age (Baker, 1991, p.4). Masur, McIntyre, and Flavell (1973) argued that the young child is not aware of the different metacognitive components, and even at the third grade, he or she has difficulty making the connection between such awareness and actual use of the implied strategies. Piaget (1928) claimed that the young child cannot distinguish between thought content and knowledge about thinking processes. Others have emphasized young children's inability to follow a cognitive model (Kreutzer, Leonard, & Flavell, 1975). Studies have shown that younger and poorer readers do not spontaneously engage in the types of metacognitive activities that have been observed in skilled readers: activities which require planful thinking (selecting certain behaviors in order to reach a goal), and self-monitoring (reading efforts during reading to attain a desired goal) (Paris & Jacobs, 1994).

In opposition to this research, others argued that although the young child is capable of deeper knowledge about cognitive functioning, he or she lacks the accumulated experience of the adult and needs more structured opportunities to make use of cognitive functions in order to learn their properties (Brown & Campione, 1977; Melitz, 1990) and acquire action strategies that are based on prior experiences (Brown & DeLoache, 1983). Studies confirming the use of various metacognitive strategies by children as young as 4 years support this claim (Flavell, 1977; Lyon & Flavell, 1993; Mohanty & Hejmadi, 1992; Wellman, 1977). Today it is generally accepted by researchers that at age 5, children are well advanced in the

development of their first theory of mind; they have developed an understanding of mental states as representations and of causal relations among actions, beliefs, experiences with the world, and mental representations (Wellman, 1992).

According to Brown, Armbruster, and Baker (1986), the pervasiveness of metacognitive deficits has been especially well documented for children who are academically at risk. In particular, the area of reading instruction has benefited from enhanced understanding of metacognitive skills (Miller, 1990, p.26).

Baker and Brown (1984) noted several factors that distinguish good readers from poor readers. Good readers progress smoothly and rapidly as long as the material is understood; once alerted to a missed idea or a comprehension failure, the process is slowed down. The reader closely scrutinizes the material, analyzing phrases and sentences for their meaning, and rereading subsequent material. The poor reader is characterized as a novice who fails to attend to the most important aspects of a task and fails to implement strategies that would facilitate comprehension.

Several researchers have compared the metacognitive performance of normally-achieving students with learning disabled students who evidence reading difficulties. Wong and Jones (1982) implemented a training study to investigate whether insufficient metacomprehension (due to poor comprehension-monitoring abilities) might be one cause of learning disabled students' reading comprehension problems. Metacomprehension was defined as the awareness of one's state of reading and/or listening comprehension. Criteria for labeling students as learning disabled were that they have adequate intelligence (as measured by the Wechsler Intelligence Scale for Children-Revised: Wechsler, 1976), were

performing 3 to 4 years below grade level in reading (as measured by the Nelson Reading Skills Test: Hanna, Schell & Schreiner, 1977), and have no sensory or physical handicaps and no record of emotional disturbance.

The experimenters provided 3 days of pretraining on the concept of "main idea," in order to ensure standard baseline of knowledge for all subjects. Those in the training condition received 2 days of self-questioning training designed to facilitate metacomprehension. Subjects were instructed to think of questions related to the ideas they had underlined and were given space to write out their questions. The normally-achieving and learning disabled students in the training condition received the same materials and were told to evaluate the quality of the writing. All subjects were given a comprehension test and were asked to recall as much of the passage as possible. Measurements of training effectiveness were based on the number of idea units underlined (indicating that the students predicted that these items would appear in a comprehension test), the number of on-target questions generated, recall of the general meaning of the passage, and the time required to complete assignments. Statistical analyses revealed that trained learning disabled students predicted progressively more important idea units across test days compared to the untrained learning disabled students, who showed a decline in the number of ideas they predicted. The authors concluded that because self-questioning training resulted in improved performance for learning disabled students, insufficient metacomprehension is one factor which contributes to their reading comprehension problems (Miller, 1990, p. 30).

A study by Carr, Schwanenflugel, and Stevens (1977) compared the declarative metacognitive knowledge of 22 gifted and 40 general cohort kindergarten and first grade

students. Children were given a metacognitive interview questionnaire examining their understanding of variables related to memory and attention. Gifted children were superior to the general cohort for only 18% of the memory and 12% of the attention questions. Collapsing across all the questions, however, the gifted showed significantly higher general metacognitive knowledge. Campione and Brown (1978) have suggested that differences in metacognition account for most individual differences in intelligence.

As the research literature on metacognition grows, there is more support for the notion that metacognition is important in students' lives. One of the most important self-regulatory skills for reading is monitoring comprehension, which involves deciding whether we have understood (evaluation) and taking appropriate steps to correct whatever comprehension problems are noted (regulation). The primary purpose of providing students with instruction in metacognition is to enable them to take responsibility for their own learning and comprehension activities (Baker, 1991, p.3). It is important to teach the metacognitive strategies in conjunction with the content that the strategies are to be applied to. This allows students to have concrete experiences with metacognition and practice the skill. It is then hoped that this skill will be transferred to other areas (Osborne, 1994).

The purpose of this research was to determine if strategically teaching metacognitive skills to high-, medium-, and low-achieving fourth grade students would influence their ability to comprehend grade level texts.

Chapter 3

Methodology

Educators are continually looking for ways to boost reading comprehension scores. In some school systems, children fill out comprehension skill sheets again and again. In others, they struggle diligently through thick workbooks in an effort to improve their Standardized Assessment Test (SAT) scores. Neither approach teaches students to use strategies that will, in fact, help them understand texts better. Worse, neither approach develops the love of reading, the very engine that invites the student into a lifetime of reading (Keene & Zimmerman, 1997, p. ix). Effective readers read strategically: they adjust their reading to fit the type of text and employ specific tactics that will help them if they encounter confusing text passages. Effective readers actively pursue meaning and carry on a mental dialogue with the writer (Barton, 1997). The ability to carry on a mental dialogue is an example of metacognition. Providing instruction in metacognition is to enable students to take responsibility for their own learning and comprehension activities (Baker, 1991, p.3). Awareness of metacognitive skills can be gleaned through instruction (Collins, 1994). By integrating metacognitive skills into classroom instruction, this teacher-researcher hypothesized high-, medium-, and low-achieving fourth grade students' ability to comprehend grade level texts would improve.

After reviewing several journals and books on the topic of metacognitive instruction, it was decided to focus on the strategies discussed in the book Mosaic of Thought: Teaching Reading Comprehension in a Reader's Workshop (Keene & Zimmerman, 1997). The goal of this researcher was to teach students how to relate unfamiliar text to their prior work

knowledge and/or personal experience. Once students were taught how to access this information, it was expected their comprehension levels would increase.

Sample

The research was conducted at Riverview Elementary School, located in the unincorporated area of Lakeside, California, approximately 25 miles east of San Diego. The school enrollment area consists primarily of private dwellings and an ever-increasing number of apartments set in a suburban district. There is an approximate 31% rate of turnover, with an average student enrollment of 460. At the time research was conducted, 119 families were receiving Aid to Families with Dependent Children (AFDC). As a result, 47% of the students were receiving free and reduced lunches. Within the last 2 years, the site has experienced an increase in the number of second language students, with a majority speaking Spanish. Riverview has the highest enrollment of second language students in the Lakeside Union School District.

The purpose at Riverview Elementary School is to create a nurtured community of learners who will become productive citizens by developing responsibility for their behavior and academic success. Using the statement, "Schools work best for students when everyone, parents, teachers, students and the community cooperate to create the best learning experience for all children," the site, community, Parent-Teacher Association (PTA), and School Site Council (SSC) generated four focus areas. The Riverview Elementary School focus areas are as follows:

1. Student well being and meeting the needs of its community
2. Professional development

3. Implementation of literacy programs

4. Acquisition of supplemented materials

The mission at Riverview Elementary School is to encourage lifelong learners. The Staff believes students can be successful if they are literate. In order to achieve this goal, they have focused their attention on the four areas mentioned above. The staff is committed to integrating the resources of the educational system, PTA, SSC, and the community so all children are encouraged to work to the best of their ability and become lifelong learners.

This study took place with approximately 60 fourth grade students, with an emphasis on 18 students, at Riverview Elementary School. The study was conducted using two separate fourth grade classrooms. The class size in each group varied between 29 to 32 students during the 6-month study. The teacher of the experimental group had been teaching fourth grade for 3 years. The teacher of the control group had been teaching fourth grade for 4 years. Both are tenured teachers in the District and also held the Cross-cultural Language and Acquisition Development (CLAD) credential.

Research Procedures

This research first came to mind during a discussion with colleagues. The teacher-researcher had joined an informal professional book club. The first book the group read was Mosaic of Thought (Keene & Zimmerman, 1997). The group read the book during the months of March and April. The group goal was to focus on a chapter and try some of the strategies and techniques in the classroom. Then the group would meet again to discuss results, complications, questions, and/or suggestions. After looking over comprehension scores, implementing one small concept from the book, and talking with other elementary

educators, the researcher felt the strategic teaching of metacognitive skills could be helpful for fourth grade students. Therefore, a research project was designed. The project was conducted over 6 months, from October to March the following year.

Experimental Group

The experimental classroom was designed to foster student accountability and student learning during the Language Arts portion of the day. Throughout the 6-month study, students were engaged in Writer's Workshop, Literature Circles, a formal writing program called "Writing First Steps," Reader's Workshop, Discussion Groups, Read Aloud, and small guided reading groups. The teacher-researcher introduced Reader's Workshop in October. It was during the Reader's Workshop time students would be introduced to metacognitive strategies. It was also during this time that students would read and respond to peers and/or the teacher in a response journal.

Students would participate in Reader's Workshop 3 days a week--Monday, Wednesday, and Friday--for approximately 1 hour each day. Each Reader's Workshop session would include a mini-lesson, a status of the class check, read and response time for students, teacher-student conferences, and book talks. Students were to respond in their journals to the teacher at least once every 2 weeks. Metacognitive strategies were introduced during the mini-lesson time (explained later in this chapter). They would then be practiced during the read and respond time. While conferencing with students individually, the teacher-researcher checked students' learning levels and reinforced the strategies taught during the mini-lesson.

Control Group

The overall Language Arts program of the control class was composed of as much reading, writing, spelling, grammar, and skills as could be taught or worked on in a day. A typical day in this classroom would begin by reading the journal topic together. As the morning progressed, the class might have read from the District-adopted Scott-Forsman readers and done one of the various activities that come with the series. Those activities usually focused on comprehension building, such as graphic organizers and story analyzers, as well as vocabulary activities. During the 2 weeks this teacher had an overflow aide, he sent four students at a time outside to read with the aide and work on comprehension. In small group guided reading sessions, the teacher encouraged students to sound out words, look at the pictures, see if there were any comprehension clues, and figure out if a word would fit in the sentence and still make sense. It was this teacher's goal to read two of the core literature novels with the whole class by the end of the school year. Using all of those methods, the teacher attempted to ensure that all students became fluent readers.

Sample

Using both classes as a base for the research, nine students were selected from each classroom. Three high-, three medium-, and three low-achieving reading students were selected. Students were chosen according to their scores on the comprehension evaluation (Appendix A) and District reading miscue (Appendix B). Books were selected for each grade level miscue using Readability Calculations by Micro Power and Light Company. To be categorized in the high group, students had to receive a 100% or better on the reading miscue and had to score in the advanced proficient or proficient range in comprehension. To be

categorized in the medium group, students had to receive a score between 94% to 98% on the reading miscue and had to score in the proficient range in comprehension. To be categorized in the low group, students had to receive a score between 80% to 96% on the reading miscue and had to score in either the non-proficient, partially proficient, or proficient range in reading comprehension. All students were selected to be in the study based on their miscue results from the first reading miscue given in the fall of their fourth grade year. Both teachers were encouraged to select their three top-, three middle-, and three lowest-performing students according to the miscue score and comprehension evaluation.

Metacognitive Strategies

During the middle of October, Reader's Workshop was introduced to the experimental group. For the first few weeks, the 10- to 15-minute mini-lessons focused on procedures of Reader's Workshop, student responsibilities, and rules. In the beginning, it was also important to spend a lot of time modeling the appropriate behaviors and responses in journals. As students learned what to do, the mini-lessons began to focus on the needs of the readers in the class.

Mini-lessons

During the month of November, mini-lessons focused mainly on how to find good books, how to use the classroom and school libraries, what other sources of literature students could read, and how to get the best book for oneself. Since Reader's Workshop was a new concept to the teacher and the students, the process was slow. As the month continued, mini-lessons began to instruct on things like character, plot, setting, and other story elements. In addition, the mini-lessons at the end of November focused on students' ability to read

expository text. Lessons focused on making predictions, examining prior knowledge, using resources, and graphic organizers.

December was a shorter month due to winter break. There were fewer mini-lessons as a result. The lessons during December continued to stress the need to respond appropriately in journals and to delve a little deeper into their own thoughts. Many lessons focused on seasonal topics, using environmental print, tapping into the thoughts we have as we read, and how to get the thoughts we have onto paper.

January appeared to be the most prolific month for productive, metacognitive, mini-lessons. The goal was to create "homes in the mind" (Keene & Zimmerman, 1997). The focal point of these lessons was schema. The teacher-researcher spent several weeks teaching the meaning of schema. Lessons focused on connections students made with literature and themselves. They also focused on making predictions on their own and questioning their own reading. Many lessons were spent talking about students' text-to-text connections. For example during the month of December we had read two books out loud during read aloud time. One book was Fig Pudding. The other book was The Best Christmas Pageant Ever. Both books took place over a length of time. However, several students made the seasonal winter connection. Many students also pointed out similar characteristics in some of the main characters in each book. By finding the connections and similarities in both books, students were better able to comprehend each book.

By the time the class made it to February, they completely understood schema and how to make text-to-text connects. The mini-lessons continued by instructing students to make text-to-self and text-to-world connections. After compiling a large class chart of

schema connections with all three types of connections, students were making connections all the time. Once they knew how to access that information, mini-lessons began to focus on creating imagery. Students analyzed poetry and the images each person created in his or her mind. From imagery, the lessons moved to questions and conversations we have as readers with the authors.

In the final month of the study, mini-lessons reviewed concepts and strategies. The strategies most emphasized were making schema connections, creating images and questions in our own minds, and how to generate and have conversations with the writer in your own mind. In the final month, the class began to look at what text was important and how to find that when reading by themselves.

Assessments

To assess learning and use of strategies, the teacher-researcher analyzed student response journals. These journals were analyzed for categories such as text-to-text connections, asking questions, making predictions, and knowing what to concentrate on. A teacher log was kept to record individual conferences. Finally, the spring miscue was used as a post to assess growth.

Chapter 4

Findings

This chapter presents a summary of the major findings of the study. The research in this study was to examine the effects of strategically teaching metacognitive skills to high-, medium-, and low-achieving fourth grade students and how it influenced their ability to comprehend grade level texts. The chapter contains the results of the reading miscue and comprehension evaluation. Results from field notes and journal responses are also included in this chapter.

Before the researcher could select students for the study, it was necessary to assess students' readability and comprehension levels in October. This was done by giving each student the District fourth grade fall miscue. The books used in assessment were selected using Readability Calculations by Micro Power and Light Company. A copy of the book, Rabbit Stew, by John Hurford, was given to each student. Students were then asked to read the book to themselves. After reading the book to themselves silently, they read a portion of the text out loud to the teacher. The teacher would then mark any miscues (Appendix A). Students were asked to read 100 words out loud. Each mistake would drop their miscue score 1%. The District considers any score of 90% or above, at grade level. After reading a short section out loud, the teacher would ask the student to tell about the book. Using a District generated score sheet (Appendix B), the teacher would assess the student's comprehension level. Comprehension levels were labeled non-proficient, partially proficient, proficient, or advanced proficient. To be considered grade level in comprehension, a student must score either proficient or advanced proficient.

Of the 62 students who were assessed, 18 students were selected to be a part of the study. Nine students from each class were chosen. Of those nine students, three were categorized as having a high, three a medium, and three a low miscue score and comprehension level. To determine if students were high, medium, or low, each teacher was given a criteria (Appendix C).

To determine if there were any effects of strategically teaching metacognitive skills to fourth grade students on their comprehension level, a second miscue and comprehension evaluation was given 6 months later, in March. The second miscue book was selected in the same manner as the first, using Readability Calculations by Micro Power and Light Company. The book used for the District spring miscue was Spider Man, by Peter Patterson. The same procedures were followed in giving the spring miscue. First the students read the book silently to themselves. Then they read a short passage out loud to the teacher. The teacher marked any miscues (Appendix D). Again, each mistake lowered the score 1%. After reading out loud 100 words, the student was asked to tell about the book. Using the District generated score sheet, the teacher evaluated each student's comprehension level (Appendix E).

Miscue and Comprehension Evaluation Results

According to the results, there was no change in the comprehension level of the high students in the experimental group (Figure 1). Two of the students remained in the proficient category, and the other remained in the advanced proficient category. However, all three decreased their miscue scores. On the fall miscue, they had all scored 100% (Figure 2). Each made one to two mistakes on the spring miscue, dropping their scores (Figure 2).

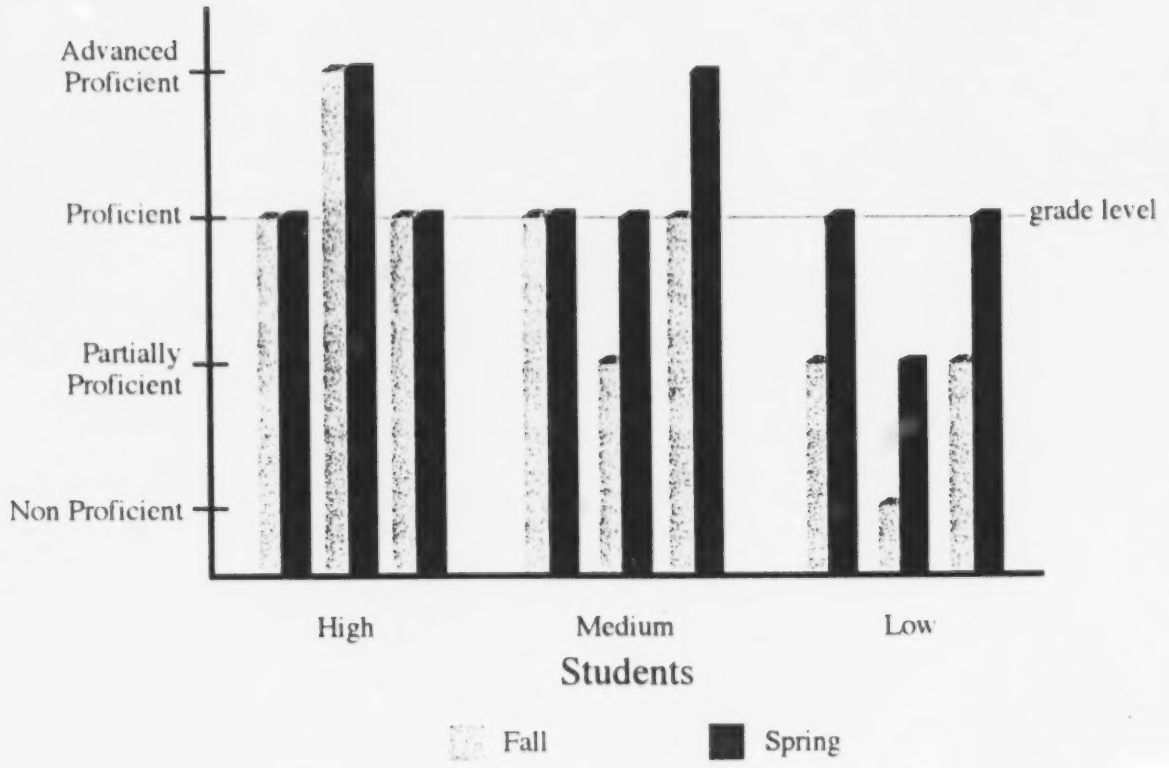

Figure 1. Experimental class: fall and spring comprehension evaluation.

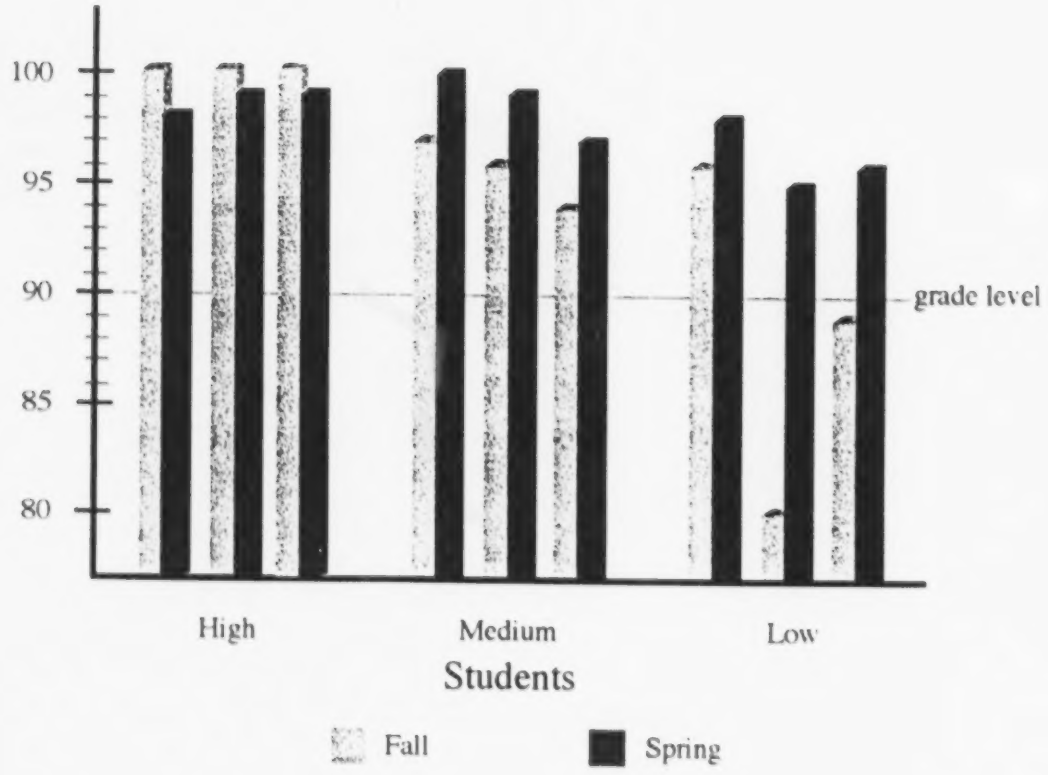

Figure 2. Experimental class: fall and spring miscue scores.

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The students from the experimental class in the medium category showed improvement on the miscue test. Two improved their comprehension levels (Figure 1). All three students improved their miscue scores by 3% (Figure 2).

Students in the low category in the experimental class improved on both the reading miscue test (Figure 2) and the comprehension evaluation (Figure 1). Each student moved up one level in comprehension. Miscue scores improved by up to 15%. One student in this group was still considered below grade level on the comprehension evaluation.

The control group had different results. All three students in the high category were evaluated to be in the advanced proficient category in reading comprehension on the fall miscue (Figure 3). On the spring miscue, all three students dropped one level in reading comprehension, from advanced proficient to proficient (Figure 3). All three students in the high category scored a 100% on the reading miscue test (Figure 4). Two students lowered their miscue scores (Figure 4).

The group categorized as medium in the control class had varying results (Figures 3 and 4). One student remained the same on both the reading miscue and the comprehension evaluation (Figures 3 and 4). The other two students improved their miscue scores by 3% (Figure 4). Of those students, one remained in the proficient range (Figure 3). The other dropped from advanced proficient to proficient (Figure 3).

Finally, the students categorized as low in the control class also had varying scores (Figure 3 and 4). The three students chosen for this group were the three lowest students in the control class. Although they scored in the proficient range on comprehension, they had lower miscue scores on the fall assessments. On the spring assessments, one student received

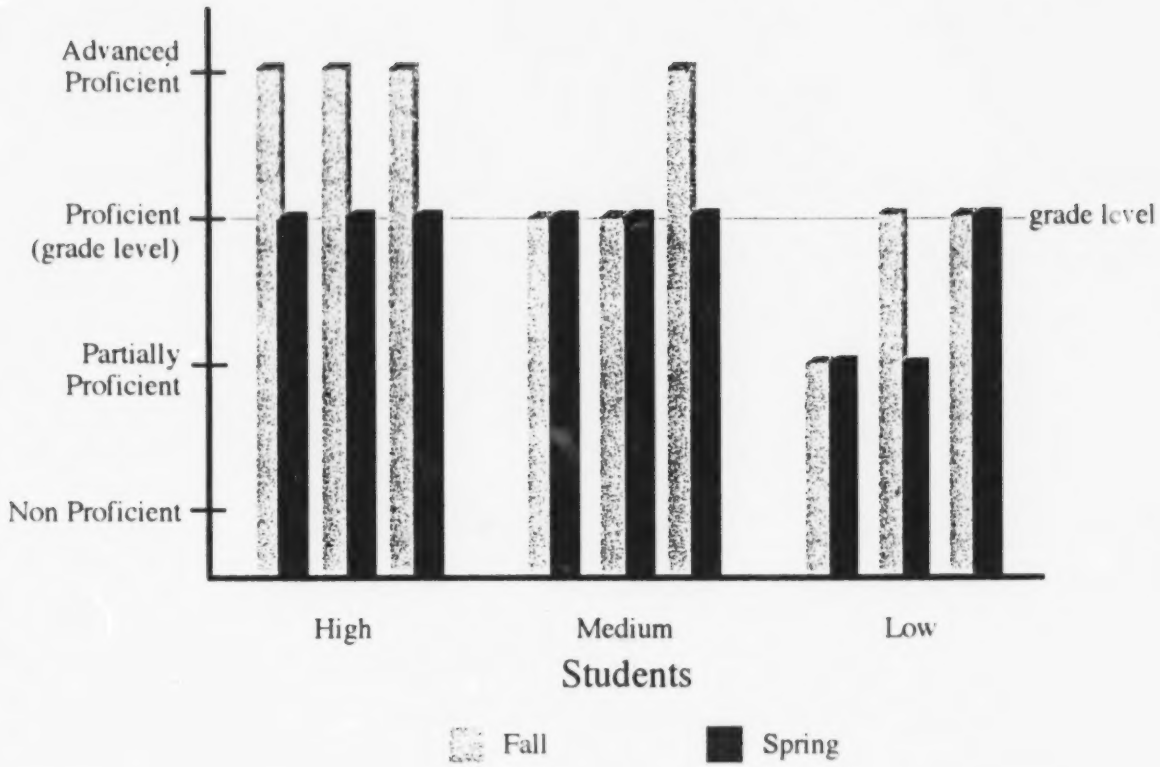

Figure 3. Control class: fall and spring comprehension evaluation.

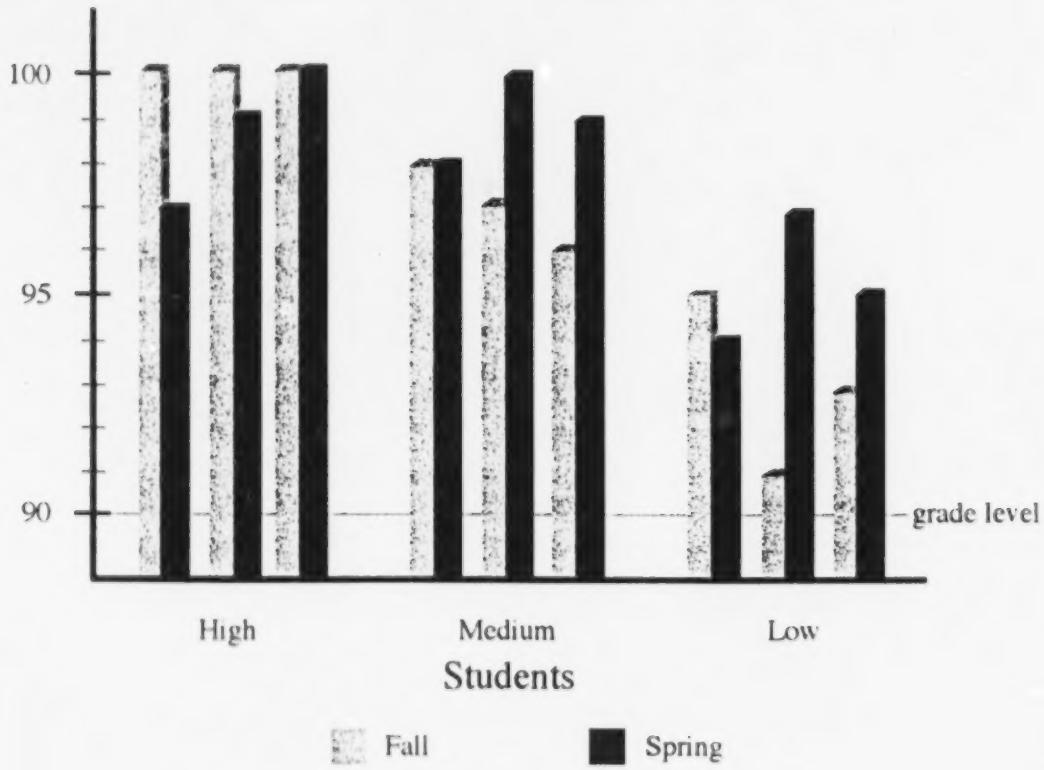

Figure 4. Control class: fall and spring miscue scores.

a lower miscue test score (Figure 4) but remained in the partially proficient comprehension level (Figure 3). The other students increased their miscue test scores (Figure 4). Of those two students, one remained in the proficient level for comprehension. The other dropped from proficient to partially proficient (Figure 3).

Teacher Log

Throughout the 6-month study, students were pulled for individual teacher/student conferences. The teacher-researcher met with each student in the experimental class six to twelve times from October to March. The teacher-researcher attempted to meet with each student in the study at least two times a month. However, this was not possible each month due to unforeseen circumstances such as illness, time constraints, assemblies, and so forth. During each conference, students were asked to talk about the books they were reading during Reader's Workshop. Each student was encouraged to discuss which metacognitive strategy, if any, he/she used during independent reading (Table 1). Students would say, "I made a text-to-text connection with this book and _____ book. The connection I had was_____." They also identified hard text by pointing it out or asking questions about it. The following categories were selected in part by student response and in part by the researcher to categorize student responses:

1. Student made text-to-text connections.
2. Student made text-to-self connections.
3. Student made text-to-world connections.
4. Student made predictions about what he/she was reading.
5. Student was able to and did identify hard text.

Table 1

Teacher Conference Log: Student Use of Metacognitive Strategies

Strategies	Students		
	High	Medium	Low
Text–to–text	3	2	0
Text–to–self	3	3	3
Text–to–world	3	1	2
Made Predictions	3	3	2
Identified hard text	1	2	2
Recognized they had insufficient background knowledge.	1	0	0
Knew what to concentrate on.	4	0	0
Asked questions before, during and after reading.	4	3	3

6. Student recognized when he/she had insufficient background knowledge.

7. Student knew what to concentrate on, could find his/her way through inconsiderate text.

8. Student asked him-/herself questions before, during, and after reading.

According to the results, students in the high group used more of the metacognitive strategies taught in class (Table 1). However, students from the experimental class in the medium and low group also used the strategies. They tended to use fewer strategies, less often (Table 1).

Student Response Journals

Students were asked to write a literary letter to the teacher in their response journals at least once every 2 weeks. They were also required to write a minimum of one letter a week to a classmate or the teacher. The letters were to be written in a three-paragraph format. Students were encouraged to write more. However, they were required to include a paragraph summarizing their reading, one paragraph using a journal starter (Appendix F), and a final paragraph including something to get the reader to write back.

The teacher-researcher compared literary journal responses of high-, medium-, and low-achieving students in seven categories (Table 2). The categories were as follows:

1. Student wrote about a text-to-text connection.

2. Student wrote about a text-to-self connection.

3. Student wrote about a text-to-world connection.

4. Student wrote about what was important in the text.

5. Student wrote questions he/she had, or asked questions of others.

Table 2

Student Response Journals: Use and/or Acknowledgement of Metacognitive Strategies

Strategies	Students		
	High	Medium	Low
Text–to–text	0	0	0
Text–to–self	7	4	9
Text–to–world	3	2	2
Mentioned what was important	8	7	6
Asked questions	4	3	4
Knew they did not have enough background information.	0	0	0
Identified difficult text, or structure.	3	1	0

6. Student wrote he/she did not have enough background information to understand the text.

7. Student wrote about difficult text or structure.

The results showed high, medium, and low students made nearly the same amount of text-to-text, text-to-self, and text-to-world connections (Table 2). Students in the high and low group asked the same amount of questions. Students in the medium group asked fewer questions than both groups. Students in the high group were able to identify difficult text more often than students in the medium group (Table 2). The low students did not identify difficult text. All three groups, high, medium, and low, did not write about lacking the background information needed for text comprehension (Table 2).

The purpose of this research was to determine if strategically teaching metacognitive skills to high-, medium-, and low-achieving fourth grade students would influence their ability to comprehend grade level texts. Results show that students who were strategically taught metacognitive skills maintained or improved their comprehension on grade level texts.

Chapter 5

Discussion

The purpose of this study was to examine the effects of strategically teaching metacognitive skills to high-, medium-, and low-achieving fourth grade students and how it influenced their ability to comprehend grade level texts. The researcher reviewed many theories and perspectives on the topics of metacognition and reading comprehension. After the literature review was completed, a plan was devised on how to strategically teach metacognitive skills to fourth grade students.

The fourth grade fall miscue score (Appendix A) and comprehension evaluation (Appendix B) were used to select nine students to participate in the experimental group and nine students to represent the control group. Criteria for selecting high, medium, and low students (Appendix C) was provided for each teacher. Students in the experimental group were strategically taught five metacognitive skills over a course of 6 months. Students in the control group were not instructed on how to use the same metacognitive skills.

The researcher used the District miscue and comprehension evaluation as a pre and post measure of any changes that occurred due to receiving strategic instruction of metacognitive skills.

Conclusions

After reviewing the pre and post miscue and comprehension evaluation scores, the researcher noticed improvement in the low students from the experimental class. Some students from the medium group in the experimental class also showed an increased

comprehension level on the post test. Students in the high category from the same class maintained the same comprehension level.

While examining the student response journals, the researcher noticed that although high-achieving students from the experimental class did not show an increased comprehension level on the post test, they did use the metacognitive skills in their response journals. Students from the high, medium, and low categories wrote several connections in their literary letters and frequently asked questions. It should be noted that in the student response journal, students did not use all of the strategies they were taught. Most students picked one skill and used it almost exclusively throughout the study, both in their response journals and during teacher conferences. Students in the medium and low groups used metacognitive skills infrequently during student/teacher conferences. Responses were elicited. Students had to be prompted to divulge what, if any, metacognitive skill they had used.

In conclusion to the question of this project, the researcher found that strategically teaching metacognitive skills to fourth grade students did influence their ability to comprehend grade level texts. After being taught how to access and build schema when necessary, delve deeper into their own minds, and ask themselves and the author questions, medium- and low-achieving students were able to increase their comprehension levels.

Implications

The students who participated in the experimental class were strategically taught metacognitive skills to influence their ability to comprehend grade level text. The nine students who were selected to represent this class demonstrated a new sense of confidence while reading. Students were eager to share connections they had made with a book or an

article in a magazine. Students who felt intimidated by chapter books or books with smaller print were more confident in their own ability to conquer the text. During time devoted to sharing books with the class, students would share their experiences, recommendations, questions, and predictions. The teacher-researcher noticed a sense of ownership by the students over all texts. Students were not afraid to become involved with a book that was read aloud, shared, or one they had been reading themselves.

It is clear from the results of this research study that low- and medium-achieving students can be influenced by the careful teaching of metacognitive skills. It is also apparent that low-achieving readers are not aware of such skills, and that, left to their own devices, they may not be able to comprehend at grade level. Evidence from this study supports the need to strategically teach metacognitive skills across the curriculum.

The researcher also felt teaching fourth grade students how to think about their own thinking increased their personal awareness. Students learned to stop and think, then how to access those thoughts and use them. The metacognitive skills that were taught to influence reading comprehension could also be used in connection with several other academic disciplines.

Limitations of the Study

It was found in this study that a Monday-Wednesday-Friday schedule may not provide the greatest number of classroom minutes to implement a program. The researcher had originally selected those days in an effort to provide 1 hour, three times a week of Reader's Workshop. However, during the course of the school year, Fridays had the most interruptions, i.e., field trips, assemblies, fire/earthquake drills, performances, and so forth.

Several Mondays were missed due to a holiday or teacher conference. In addition, the teacher-researcher missed 2 weeks due to jury duty. Altogether, several days of the study were omitted because of unforeseen circumstances.

Another limitation of the study was class size. The fourth grade class had 32 students. Although there were only nine students in the study, 32 students were also receiving the same instruction. Thus, time for student/teacher conferences was limited. Without a consistent number of 32 students in the class, no aide was provided, creating less one-on-one time for each student.

Finally, the researcher had to teach the Reader's Workshop format to all of the students in the class. The teaching of structure, procedure, and expectations during Reader's Workshop took up a large percentage of the mini-lesson time that had been planned for teaching metacognitive skills. Therefore, a full spectrum of skills was not taught in the 6 months, as was planned.

Directions for Further Research

As the teacher-researcher of this study, it would be interesting to attempt the same study again on a group of students who were already trained in Reader's Workshop. This researcher would also like to attempt the same study on different days, with the help of another adult, to increase one-on-one time with each student. It also would be interesting to re-test the students in the years to come to see if they continued to use the metacognitive skills they were taught.

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Appendix A

Comprehension Evaluation

STUDENT FICTION RETELLING ASSESSMENT
"Rabbit Stew"

__ Not Proficient 0–4 may include prompting and questioning	__ Partially Proficient 5-7 may include prompting and questioning	__ Proficient 8-10 may include prompting and questioning	__ Advanced 8-10 without prompting problem and solution/ resolution must be indicated

	Includes without Prompting	After Prompt	After Questioning
Characters names main character *(Fox)* . . . . . . names other characters *(Rabbit, Weasel, Squirrel, Pheasant, Turkey, Crow)*	. . . . .	. . . . .	. . . . .
Setting tells when story happened *(daytime)* . . . . . . tells where story happened *(outside, Fox's den)*	. . . . .	. . . . .	. . . . .
Goal/Problem identifies goal or problem *(cooking the rabbit)*			
Events starts at beginning *(Fox caught rabbit)* . . . . . . includes all major events *(Weasel suggests onions. Squirrel & Pheasant suggests hazelnuts & raisins. Turkey suggests cranberries/ Crow suggests spices/hot sauce. Rabbit pepper. Crow suggests tasting. Fox has steam out of ears & runs to river.)* . . . . . . includes some major events . . . . . . tells events in sensible order	. . . . .	. . . . .	. . . . .
Solution/Resolution tells how problem was solved or goal was met *(Friends untie rabbit and dance around pot)*			
Evaluative Comments:			

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Appendix B

Reading Miscue #1

The she saw her mother	Omissions
the forest was a big part	Insertions
She worked with him	Substitutions
He was a lassmaster (pronounced p a s s m a s t e r)	Mispronunciation. (proper nouns are not errors)
His eyes were drooping	Default. (words supplied by Teacher)

Positive Reading Strategies should be noted on miscue, but not counted as an error.

He saw his (SC) teacher	Self Corrections
The boy went to school	Repetitions
She thundered the order	Hesitations

RABBIT STEW

One day Fox caught a rabbit. "Yahoo!" yowled Fox, "I've got a rabbit." So he tied him up and set off for his den. On the way he met Weasel. "I've got a rabbit," said Fox proudly. "So I can see," said Weasel, licking his lips. "But what good is a rabbit if you haven't got onions to cook it with?" "What a good idea," said Fox. "I love rabbit with onions." So Weasel rushed off and brought back a bag of onions, and off they went into the woods. There they met Squirrel and Pheasant. "Fox has caught a

Total Words 122

Number of Miscues ____

Percentage ____

Evaluative Comments: _____

_____

_____

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Appendix C

Criteria for Selecting Students

* How to select students for study:

- High-achieving students must have scored 100% on the fall miscue. These students should have been evaluated at a proficient or an advanced proficient level to be considered for this category.
- Medium-achieving students should have scored between 94% and 98% on the fall miscue. These students should have been evaluated as being proficient in comprehension.
- Low-achieving students may have scored between 80% and 96% on the fall miscue. Students in this category should have been evaluated as either non-proficient, partially proficient, or proficient.

* For each of the three categories, pick your top three, middle three, and lowest three achieving students. Use the above numbers and comprehension levels as a guideline in selecting the appropriate students for the study.

Appendix D

Reading Miscue #2

(They) the saw her mother	Omissions
the forest was a big park	Insertions
They She worked with him	Substitutions
He was a fatchmaster	Mispronunciation, (proper nouns are not errors)
His eyes were drooping	Default, (words supplied by Teacher)

Positive Reading Strategies should be noted as miscue, but not counted as an error.

He saw his teacher.	Self Corrections
The boy went to school.	Repetitions
She thundered the order	Hesitations

SPIDER MAN

Whenever you see a spider, remember that for many thousands of years other people have watched them, too. Like you, they have wondered about the things spiders do - things that neither you nor I could possibly manage. In Africa, people tell a story that shows how special spiders are. In the beginning, the story goes, all the animals in the world were male. They longed to have wives, but all the female animals were goddesses, and they were up in heaven. How could the lonely male animals on earth ever get to know them? Only the spider could help them.

Total Words 170

Number of Miscues ____

Percentage ____

Evaluative Comments: _____

_____

_____

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Appendix E

Student Non-fiction Retelling Assessment

STUDENT NON-FICTION RETELLING ASSESSMENT
"Spider Man"

__ Not Proficient 0-1 may include prompting and questioning	__ Partially Proficient 2-3 may include prompting and questioning	__ Proficient 4-5 may include prompting and questioning	__ Advanced 4-5 without prompting

	Includes without Prompting	After Prompt	After Questioning
<u>Major Concepts</u> Main idea author wants learned *(Spiders are special. Spiders have been unfairly treated. Spiders are interesting.)*			
<u>Generalizations</u> Other important information about the main topic *(Spider faces differ considerably. Spiders use spinerettes to spin their webs. Spiders don't have ears, they feel vibrations through their legs. Hunting spiders don't make webs. They hunt in many ways. Tarantulas were here before dinosaurs. Female spiders spin egg sacs. Spider removes skin as it grows, can travel on air currents, won't bite unless frightened. Spiders have 8 eyes.)*			
<u>Specific Information</u> Specific facts *(The whole book is filled with specific facts. Student should relate several specifics.)*			
<u>Logical Structuring</u> How did the author present the information *(Author records facts through photographs he's taken and his experience with spiders.)*			
<u>Connections to Prior Learning</u>			
<u>Evaluative Comments</u>:			

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Appendix F

Journal Starters for Student Response Journals

- I began to think of...
- I love the way...
- I noticed...
- If I were...
- My favorite character is...
- When I don't know a word I...
- I wish that...
- I can't believe...
- I wonder why...
- I think...
- I'm not sure...
- I like the way the author...
- I felt sad when...
- This made me think of...